

NEWS



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FIRST PLANETARY

PARACHUTE TEST

PLANNED AUG. 29

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The first of a series of high-altitude experiments to investigate parachute designs and techniques for landing instrumented capsules on Mars will be conducted on or after Aug. 29 by the National Aeronautics and Space Administration.

The experiment supports the proposed NASA Voyager program to explore the planets and possibly land a capsule on the surface of Mars in 1973.

The research and technology effort includes flying experimental parachute-equipped payloads at high altitudes where the thin Earth atmosphere compares with that of Mars. Flight units of varying shapes and sizes will be accelerated to determine how well different parachutes can be deployed behind them.

The disk-shaped flight unit for the Aug. 29 test is 15 feet in diameter and contains a ring of 12 small rockets for acceleration. The flight unit will be carried to about 130,000 feet (24.5 miles) by the largest balloon system ever developed by this country. It will be launched from Walker Air Force Base, N.M. Wind and cloud conditions could cause postponement on a day-to-day basis.

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A cylindrical payload centered in the 1,600-pound flight unit will include a packaged ring-sail parachute, cameras and other instruments to record loads and parachute deployment.

When fully opened, the test parachute canopy has a diameter of 84 feet. The canopy has 13 rings of fabric. Crescent-shaped air gaps between the rings permit air to flow through, averting excessive swinging.

A ground command will trigger release of the flight unit from the balloon. Later programmed events will be controlled by timer mechanisms on the parachute payload and the "aeroshell," the disk-shaped portion of the flight unit.

Four seconds after dropping from the balloon, the 12 rocket engines will be ignited to propel the flight unit upward into an arching trajectory. Desired test velocity is about Mach 1.2, or about 850 miles per hour. Under these conditions at the high altitude, the velocities and dynamic pressures attained will closely correspond to those of a capsule descending through the Martian atmosphere.

With these conditions reached, the test parachute will be deployed. About one-half second later, the instrument and ballast package will be released from the aeroshell and pulled out by the inflation of the parachute in its reefed condition.

About 4 seconds later, the parachute will be fully opened. In another 22 seconds, the ballast will be dropped from the parachute payload.

Approximately two hours will be required for the 26 million-cubic-foot balloon to bring the flight unit to the desired altitude. Then an indefinite period will begin, possibly lasting several hours, as the balloon floats toward its drop point. When the proper area is reached, test officials and the range safety officer must determine that the flight path will be within the range of ground-tracking stations and poses no safety hazards.

When an on-board magnetometer confirms that the flight unit, tilted 60 degrees to horizontal, is aimed in the proper direction, a radioed command will activate the release lanyard.

Release from the balloon will automatically start the timers, tape recorders and motion picture cameras on the flight unit. Accelerometers will record data throughout the flight.

The 12 rockets are angled around a ring so that the thrust provided by each is directed through the center of gravity of the total flight unit. Each solid propellant rocket provides a maximum thrust of 3,400 pounds. Burning time is 1.5 seconds.

No air-to-ground telemetry is involved. Radar tracking, visual tracking by aircraft, homing beacons and camera cross fixes will be used to monitor the experiment and to assist in recovery of the payload and aeroshell.

Descent of the parachute and payload is expected to take about 100 minutes. The aeroshell should impact 14 minutes after separation.

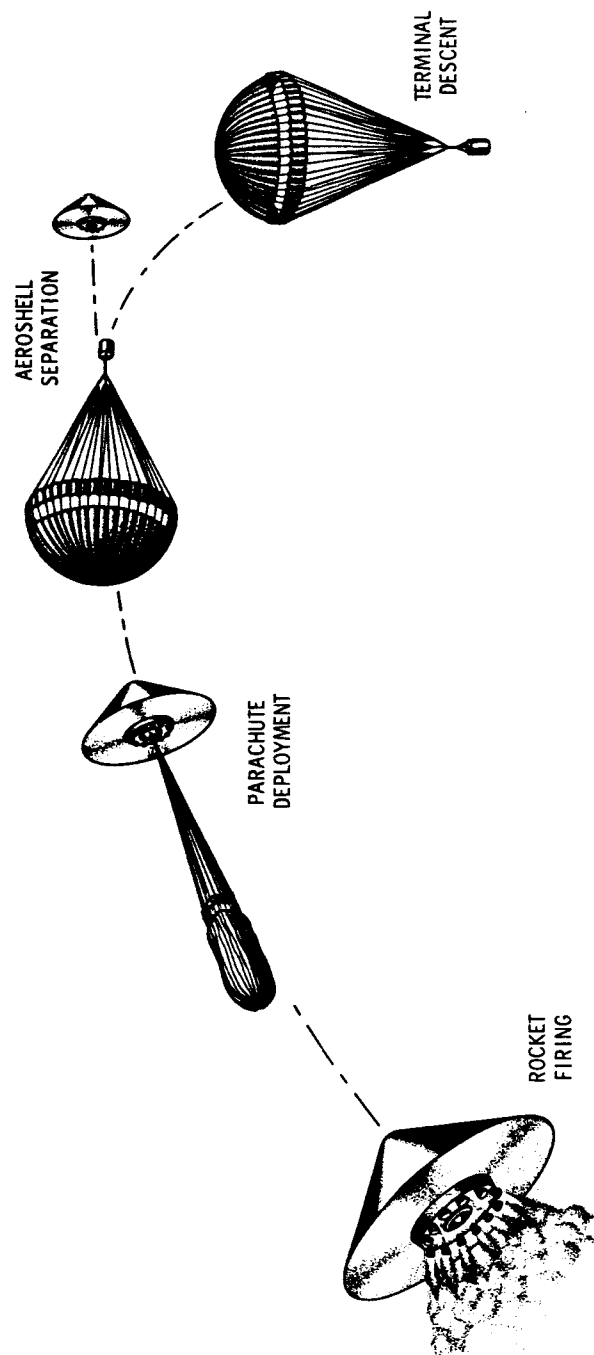
Because the desired data will be recorded by cameras and tape recorders, evaluation of the flight's success may take three or four days.

Two cameras are on the aeroshell and three on the parachute payload. Two of the aeroshell cameras and one on the payload will face rearward to record the parachute deployment. One payload camera will face to the side to observe the position of the horizon. The third payload camera will face ahead to record changes in motion.

The parachute project is managed by the NASA Langley Research Center, Hampton, Va., and is coordinated with the Jet Propulsion Laboratory, Pasadena, Cal., which has management responsibility for the Voyager program. The payload was designed and built by Langley.

The Air Force Cambridge Research Laboratories, Bedford, Mass., is responsible for providing and launching the 800-foot-tall balloon system. The balloon system was built by the G.T. Schjeldahl Co., Northfield, Minn.

The Air Force-developed balloon system was successfully test-flown July 18 from Holloman Air Force Base, N.M. It carried a dummy payload to 130,000 feet.



PLANETARY ENTRY PARACHUTE TEST